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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/596,262

06/07/2006

Klaus Hahn

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EXAMINER

RIOJA, MELISSA A

ART UNIT

PAPER NUMBER

1796

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/596,262	<b>Applicant(s)</b> HAHN ET AL.	
	<b>Examiner</b> MELISSA RIOJA	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1 – 3, 5, and 6** are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,010,111 to Hahn et al.

**Regarding Claims 1 and 2.** Hahn et al. teach expandable styrene polymers in bead form comprising a styrene polymer component (a) that may be polystyrene and/or a copolymer composed of styrene. The styrene polymer may therefore be a homopolymer. The styrene polymer has a mean molecular weight ( $M_w$ ) of 60,000 to 200,000. However 0.1 to 10% of component (a) may be a styrene polymer with a  $M_w$  of 500 to 5,000 (Column 1, Lines 24 - 24 and 49 - 67; Column 2, Lines 20 - 24).

Hahn et al. do not expressly teach the chemical composition of the lower molecular weight ( $M_w$  of 500 to 5,000) styrene polymer. However, Hahn et al. do teach styrene polymers in the reference may be copolymers wherein suitable monomers for

preparing the styrene copolymers include  $\alpha$ -methylstyrene and acrylonitrile (Column 1, Lines 24 - 24 and 49 - 67). Hahn et al. also go on to teach embodiments in which component (a) comprises a mixture of 95 to 99.5% by weight of polystyrene and 0.5 to 5% by weight a styrene-acrylonitrile copolymers (Column 2, Lines 32 - 36). It is consequently submitted that, at the time of invention, it would have been obvious to a person of ordinary skill in the art to select a styrene copolymer as the lower molecular weight copolymer in the invention taught by Hahn et al. The motivation would have been that, for example, the presence of 0.5 to 5% by weight styrene copolymer comprising acrylonitrile in a mixture of polystyrene is associated with a reduction in foam shrinkage (Column 2, Lines 27 - 37).

**Regarding Claims 3 and 6.** Hahn et al. teach the styrene polymer of Claims 1 and 2 wherein the material comprises 1 to 10% by weight of a blowing agent such as a C<sub>3</sub> to C<sub>6</sub> aliphatic hydrocarbon (Column 3, Lines 38 - 44).

**Regarding Claim 5.** Hahn et al. teach a process of producing foam moldings in which the expandable polystyrene particles of Claim 1 are pre-foamed using steam to a bulk density of 15 g/l. Then, the particles are welded to form a block in a mold (Column 5, Lines 1 - 7).

**Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,010,111 to Hahn et al., as applied to Claim 1 above, and further in view of EP 0 126 469 to Biglione et al.

**Regarding Claim 4.** Hahn et al. teach a process for preparing expandable styrene polymers by first preparing the mixture set forth in Claim 1. The blowing agent can be added before, during, or after polymerization. The resultant polymers have a mean diameter from 0.1 to 6 mm (Column 3, Line 60 – Column 4, Line 7).

Hahn et al. do not teach the claimed process steps of mixing the blowing agent at a temperature of at least 150°C, cooling the polymer melt to at least 120°C, and pelletizing the melt underwater at a pressure in the range of 1 to 25 bar. However, Biglione et al. also teach a method of making expandable polystyrene granules in which polystyrene and a blowing agent are blended at a temperature of 160°C. The resulting mixture is extruded through a die head (Example 1). The temperature for extrusion is adjusted according to the size of the holes in the die head. When the holes have a diameter between 2 – 4 mm, the melt must be extruded at a temperature between 100 and 130°C (Page 7, Lines 8 – 18). The die head protrudes into a chamber in which water is circulated at a pressure of 9 bar to produce expandable polystyrene granules (Example 1). Hahn et al. and Biglione et al. are analogous art as they are from the same field of endeavor, namely expandable polystyrene particles. At the time of invention, it would

have been obvious to a person of ordinary skill in the art to use the method taught by Biglione et al. to prepare the expandable styrene beads taught by Hahn et al. The motivation would have been that the method taught by Biglione et al. provides advantages such as producing polystyrene particles with a more standardized shape.

**Claim 7** is rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,010,111 to Hahn et al., as applied to Claim 1 above.

**Regarding Claim 7.** Hahn et al. teach the polymer of Claim 1 wherein styrene polymer has a mean molecular weight ( $M_w$ ) of 60,000 to 200,000 (Column 1, Lines 24 - 24 and 49 - 67; Column 2, Lines 20 - 24). While applicant has claimed a styrene polymer having a molar mass in the range of 220,000 to 300,000 g/mol, a *prima facie* case of obviousness exists where the claimed ranges and prior art do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) (MPEP 2144.05).

### ***Response to Arguments***

Applicant's arguments filed January 22, 2010 - see page 2, paragraph 4 and page 3, paragraph 2 - with respect to the rejection(s) of claim(s) 1 - 7 under 35 U.S.C. 102(b)

and 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of US 5,010,111 to Hahn et al. Applicant's arguments filed August 12, 2009 in response to the final rejection in which Hahn et al. was used as a primary reference are thus responded to below.

Applicant's arguments filed August 12, 2009 have been fully considered but they are not persuasive because:

Applicant argues that the instant claims are not obvious over Hahn et al. because Hahn et al. does not expressly teach the lower molecular weight component to be a copolymer and the higher molecular weight to be a homopolymer. However, Hahn et al. teach styrene polymer component (a) may be polystyrene and/or a copolymer composed of styrene (Column 1, Lines 49 – 67). The styrene polymer may therefore be homopolymer.

Hahn et al. does not expressly teach the chemical composition of the lower molecular weight ( $M_w$  of 500 to 5,000) copolymer present in an amount of 0.1 to 10% of component (a). However, the Office respectfully disagrees that this styrene polymer must necessarily have the same chemical composition as the higher molecular weight polystyrene. Hahn et al. refer to this the lower molecular weight polymer as a "styrene polymer." Elsewhere in the reference, "styrene polymers" may describe polystyrene or

copolymers (Column 1, Lines 23 - 50). Hahn et al. even go on to expressly teach embodiments of component (a) wherein (a) is a mixture of polystyrene and lesser amounts of styrene-acrylonitrile copolymer (Column 2, Lines 27 - 49). For the reasons set forth in the new grounds of rejection above, it is submitted that it would be readily envisioned that this styrene polymer is suitably a copolymer.

### *Correspondence*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MELISSA RIOJA whose telephone number is (571)270-3305. The examiner can normally be reached on Monday - Friday 7:00AM - 3:30PM E.S.T..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on (571)272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Eashoo/  
Supervisory Patent Examiner, Art Unit 1796

/MAR/  
April 23, 2010